

WHAT IS CLAIMED IS:

1 1. A voltage-controlled oscillator discrete-time
2 amplitude control system comprising:

3 a voltage-controlled oscillator; and
4 a control circuit sensing an amplitude of an
5 output of the voltage-controlled oscillator and adjusting
6 operation of the voltage-controlled oscillator, if
7 necessary, at discrete intervals.

1 2. The voltage-controlled oscillator discrete-time
2 amplitude control system according to claim 1, further
3 comprising:

4 a bias circuit setting at least one of a voltage
5 bias and a current bias for the voltage-controlled
6 oscillator under control of the control circuit.

1 3. The voltage-controlled oscillator discrete-time
2 amplitude control system according to claim 2, wherein
3 control of the voltage bias or the current bias adjusts the
4 amplitude of the output of the voltage-controlled
5 oscillator.

1 4. The voltage-controlled oscillator discrete-time
2 amplitude control system according to claim 2, wherein the
3 control circuit further comprises:

4 a comparator periodically comparing the amplitude
5 of the output of the voltage-controlled oscillator to a
6 reference amplitude; and

7 logic increasing or decreasing the voltage bias
8 or the current bias based upon an output signal of the
9 comparator responsive to comparison of the amplitude of the
10 output of the voltage-controlled oscillator to the
11 reference amplitude.

1 5. The voltage-controlled oscillator discrete-time
2 amplitude control system according to claim 1, wherein the
3 control circuit adjusts operation of the oscillator only
4 during a calibration phase, holding operation of the
5 voltage-controlled oscillator constant after completion of
6 the calibration phase.

1 6. The voltage-controlled oscillator discrete-time
2 amplitude control system according to claim 1, wherein the
3 voltage-controlled oscillator produces a differential
4 output signal.

1 7. A wireless transmitter including the voltage-
2 controlled oscillator discrete-time amplitude control
3 system according to claim 1, the wireless transmitter
4 further comprising:

5 a low noise amplifier operating on a wireless
6 signal in conjunction with the voltage-controlled
7 oscillator; and

8 a modulator operating on the wireless signal.

1 8. A wireless communications system including the
2 wireless transmitter according to claim 7, the wireless
3 communications system further comprising:

4 a receiver receiving the wireless signal.

1 9. A wireless transceiver including the wireless
2 transmitter according to claim 7, the wireless transceiver
3 further comprising:

4 a receiver operating on a second wireless signal
5 forming a communications channel with the wireless signal.

1 10. A method of discrete-time amplitude control
2 system for a voltage-controlled oscillator, the method
3 comprising:

4 operating a voltage-controlled oscillator; and
5 sensing an amplitude of an output of the voltage-
6 controlled oscillator and adjusting operation of the
7 voltage-controlled oscillator, if necessary, at discrete
8 intervals.

1 11. The method according to claim 10, further
2 comprising:

3 setting at least one of a voltage bias and a
4 current bias for the voltage-controlled oscillator under
5 control of the control circuit.

1 12. The method according to claim 11, wherein control
2 of the voltage bias or the current bias adjusts the
3 amplitude of the output of the voltage-controlled
4 oscillator.

1 13. The method according to claim 11, further
2 comprising:

3 periodically comparing the amplitude of the
4 output of the voltage-controlled oscillator to a reference
5 amplitude; and

6 increasing or decreasing the voltage bias or the
7 current bias based upon an output signal of the comparator
8 responsive to comparison of the amplitude of the output of
9 the voltage-controlled oscillator to the reference
10 amplitude.

1 14. The method according to claim 10, further
2 comprising:

3 adjusting operation of the oscillator only during
4 a calibration phase; and

5 holding operation of the voltage-controlled
6 oscillator constant after completion of the calibration
7 phase.

1 15. The method according to claim 10, wherein
2 operation of the voltage-controlled oscillator produces a
3 differential output signal.

1 16. A voltage-controlled oscillator discrete-time
2 amplitude control system comprising:

3 a voltage-controlled oscillator producing a
4 differential output signal;

5 a control circuit sensing an amplitude of the
6 output signal and generating a control signal for
7 controlling biasing of the voltage-controlled oscillator;
8 and

9 a biasing circuit biasing the voltage-controlled
10 oscillator based upon the control signal,

11 wherein the biasing of the voltage-controlled
12 oscillator is adjusted, if necessary, at a predetermined
13 point within a recurring period.

1 17. The system according to claim 16, wherein
2 adjustment of the biasing of the voltage-controlled
3 oscillator sets the amplitude of the output signal.

1 18. The system according to claim 16, wherein the
2 biasing circuit further comprises:

3 a voltage bias circuit for setting a voltage bias
4 of the voltage controlled oscillator; and

5 a current bias circuit setting a current through
6 the voltage-controlled oscillator.

1 19. The system according to claim 16, wherein the
2 voltage-controlled oscillator further comprises:

3 an inductive-capacitive tank circuit including a
4 voltage-variable capacitance;

5 a voltage divider coupled to output nodes of the
6 tank circuit; and

7 a coupled-emitter, cross-coupled pair of
8 transistors coupled to the voltage divider and providing
9 negative transconductance compensating for losses within
10 the tank circuit.

1 20. The system according to claim 16, wherein setting
2 of the amplitude of the output signal eliminates process
3 and temperature dependencies of the amplitude.